

WHAT EFFECT DO STUDENT LEARNING PREFERENCES (VARK) HAVE ON AN INTERMEDIATE ACCOUNTING I ACTIVE-LEARNING CASE INVESTIGATED OVER FOUR SEMESTERS?

Judith A. Sage, A. R. Sanchez, Jr. School of Business, Texas A & M International University, 5201 University Blvd., Laredo, TX 78041, 956-326-2493, lloydsage@aol.com

Lloyd G. Sage, A. R. Sanchez, Jr. School of Business, Texas A & M International University, 5201 University Blvd., Laredo, TX 78041, 956-326-2493, lloydsage@aol.com

ABSTRACT

An Intermediate Accounting I Active-Learning Case was investigated over four semesters. The Financial Statement Analysis Case involved teamwork, written reports, oral presentations, and peer reviews. A significant difference resulted between mean scores ($p = .01$) on Exam I (before Case) and on the Final Exam (after Case) during all four semesters. Also, an analysis was used to evaluate whether the Case was more beneficial for students with different learning preferences. A high percentage of the test results improved/remained the same for the “Read/Write,” “Kinesthetic,” and “Aural” Preference students. This Case appears to be a good teaching method for students with various learning preferences.

INTRODUCTION

Over several decades various recommendations have been made for the modification of the university accounting curriculum. In July 2012, the Pathways Commission (sponsored by AAA & AICPA) suggests that learning experiences or approaches should be created to encourage students to think, perform, and make decisions as professional accountants. This research study investigated a learning experience (active-learning case) that should encourage students to think and make accounting decisions. Our research study investigated four semesters of an active-learning financial statement analysis case project for an Intermediate Accounting I course.

In order to assist instructors in teaching, Shanahan and Meyer (2001) suggest that research be conducted to facilitate a better understanding of what, why, and how students learn. One way to better understand the students’ learning process is to consider the students’ learning styles or preferences when teaching.

To enhance the effectiveness and quality of the students’ learning, Hawk and Shah (2007) recommend the use of learning-style instruments to assist in the selection of student instructional activities. Baltazar *et. al.* (2001) suggest that course designs should include instructional methods that reflect student learning preferences because of the individual learning-style differences of the students. Various student learning styles were considered in the development of the active-learning case project used in our study.

Sandman (2009) indicates that by using *any* learning-style instrument an instructor can obtain insight about how to provide for diverse learning styles that are present in a class. In our study the students' learning preferences were determined using the VARK learning preference inventory instrument [Fleming and Mills (1992)]. The students' learning preferences were analyzed to ascertain the benefit of the students' preparation, presentation, and peer evaluation involved in our active-learning case.

According to Albrecht and Sack (2000) accounting educators need to help students develop their ability-to-learn skills. More recently, Gammie and Kirkham (2008) state that the ability to "learn to learn" is a key competency in order for accountants to adapt to the rapidly changing business environment. The active-learning financial statement analysis case project utilized in this research study should give the students an opportunity to develop or expand their ability to "learn to learn."

The Pathways Commission (2012) indicates that accountants must possess both technical knowledge and professional skills such as the ability to communicate effectively. Also, PricewaterhouseCoopers in *Educating for the Public Trust* (2003) concludes that among other curriculum changes there should be an emphasis on a higher level of interpersonal and communication skills. Further, the International Federation of Accountants (IFAC) in *International Education Standard 3 (IES3), Professional Skills and General Education* (2008) emphasizes that interpersonal and communications are necessary skills for accountants entering the profession. Our active-learning case required the students to write, make oral presentations, and utilize critical thinking skills in making decisions.

Further, the Pathways Commission (2012) indicates that to be competent an accountant needs not only technical knowledge but also must possess professional skills such as the capability to use knowledge to make reasoned judgments. In addition, the Canadian Institute of Chartered Accountants (CICA) in its *CA Skills and Competencies* (2010) report recommends that students should learn to examine and interpret information and ideas critically. Our case project required the students to analyze financial/nonfinancial accounting information obtained as a basis for decision-making purposes (e.g., the selection of the company in which to invest).

Also, Albrecht and Sack (2000) suggest group activities to teach both leadership and how to work together. In addition, the IFAC in IES3 (2008) indicates the need for students to learn to work with others, to negotiate acceptable solutions, to listen effectively, and to solve any conflicts that may occur. Further, both the Kavanagh and Drennan (2008) and the Kennedy and Sorensen (2006) studies suggest that employers expect accounting graduates to be able to successfully work on a team, in addition to possessing accounting analytical skills. Our active-learning case involved group work.

The written active-learning technique encompassed in our financial statement analysis case project should encourage students to "learn to learn." This study contributes to the accounting literature by analyzing a case that exposes Intermediate Accounting I students in four different semesters to financial and nonfinancial information found in publicly traded company annual reports and SEC 10-K reports. This case involved the analysis of two companies within one industry for each team (e.g., auto manufacturing, trucking, airlines, or department stores).

THEORY

One technique to evaluate students' learning is to use pre- and post-study measurements. According to Angelo and Cross (1993), the purpose of utilizing pre- and post-assessment techniques is to determine

whether students have benefited from class discussions and assignments. The pre-test allows the instructor to establish a benchmark of what the students know on the subject matter being investigated before the study technique is utilized. Gordon (1998) has used the pre- and post-assessment technique to evaluate students' knowledge of social responsibility accounting.

In our study, Exam II, which was administered after discussing the homework problems on the financial statement ratio analysis topics (but before the Case was assigned), was designated as the pre-test. After Exam II there was no other class discussion or homework involving financial ratios or other questions included in the Case. The Final Exam, which was given after the students completed the Case, was identified as the post-test.

In summary, the literature suggests that student active-learning exercises can enrich the learning process. The following hypothesis is used to test the benefit of the active-learning technique encompassed in our Case:

H₁: The distribution of exam scores on the financial statement analysis questions in Exam II (before the active-learning exercise) and in the Final Exam (after the active-learning exercise) are the same.

A short learning preference inventory instrument (VAR_K), which was developed by Fleming and Mills (1992) to determine sensory modality preferences when processing information [i.e., instructional preference(s)], was used in this research. VAR_K is an acronym for Visual, Aural, Read/Write, and Kinesthetic sensory modalities that are utilized for learning information.

According to Fleming and Mills, the "Visual Preference" modal includes depiction in the form of charts, graphs, flowcharts, symbolic arrows, circles, hierarchies, and other methods that can be used to represent what could be presented in words. The "Aural Preference" modal involves learning from lectures, tutorial and talking to other students. Students with the "Read/Write Preference" modal learn when the information is displayed as words. The "Kinesthetic Preference" modal involves learning through experience, examples, practice or simulation. It should be noted that students can have more than one learning preference.

RESEARCH METHODS

Intermediate Accounting I classes taught by one of the researchers during four semesters were used in the research experiment. The course instructor required the students to complete the VAR_K inventory instrument (VAR_K), which takes about 10-15 minutes to complete, the first day of class. The project involved financial statement analysis for the two most recent years of annual reports and/or SEC 10-K reports for two companies within the same industry (e.g., Home Depot and Lowe's) for each team. Each team analyzed a different industry (e.g., hotels, shoes, grocery stores or manufacturing) during each of the four semesters. Other than the selection of the industry by the team, the entire Case was prepared outside of class.

The students were required to prepare a team written report, which included three parts. First, the team was required to calculate liquidity ratios, solvency ratios, and profitability ratios for the two most recent years. Then, the students used the financial statement ratio analysis results as the basis for answering a set of questions. Finally, for the most recent year, the team was required to answer another set of

questions related to each company's annual and SEC 10-K reports. In addition, to assure that each student has writing experience in the preparation of this Case, each student was required to write a one-page report. This individual report required the students to give their opinions as to the firm they would select for investment purposes. Also, each team was required to present their analysis in an oral presentation (15 to 20 minutes) to their classmates.

As the Pathways Commission (2012) recommends, the Case is designed to encourage deep engagement of the students by holding them accountable to the instructor and fellow students through the use of an evaluation form during their oral presentations. The Case presentation involved evaluating each student as a separate presenter and the evaluation of the team as a whole. The evaluation form allowed the instructor and the non-presenting students to grade the presenting individuals based on (1) the content of their segment or topic presented, (2) the organization of their presentations, (3) the use of visual aids during their presentations, and (4) the effectiveness of the delivery of their presentations. Each classmate and the instructor had equal evaluation weight in determining the student scores for the presentations.

In addition, the evaluation form defined the characteristics on which the teams were evaluated. The team score was based on (1) the content of the team case presented; (2) the organization of the entire team presentation; (3) the coordination of visual aids used by the team; and (4) the cohesiveness of the team presentation. The students were informed to keep the evaluation forms confidential. The evaluation form permitted the evaluators to write comments and suggestions for each presenter and for the overall team presentation. The instructor summarized the comments and attached them to the student's graded individual written report. As the Pathways Commission (2012) suggests, it was expected that the students will benefit from peer evaluation/observation and comments.

Approximately a week following the discussion of the homework problems on the financial statement analysis topics, Exam II was administered. Exam II was given before the students started their active-learning exercise (i.e., financial statement analysis case project). In our study Exam II was designated as the pre-test. After Exam II there was no other class discussion or homework involving financial ratios or other questions included in the Case. About a week after the students made their presentations and completed their team and individual reports, a Final Exam was administered. The Final Exam had questions related to the financial statement analysis topics that were different than those that were given on Exam II but were similar in the level of complexity. The Final Exam was considered as the post-test in our study. The results of Exam II and the Final Exam were used to measure the effectiveness of this active-learning exercise technique.

The pre-test/post-test analysis can also be used to evaluate if the financial statement analysis case project (Case) is more beneficial or helpful for students with different learning preferences. The Case may not be as equally helpful for all learning style preferences. Baltazar *et. al.* (2001) recommend that course designs should include instructional methods that reflect student learning preferences. As a result, student learning preferences were compared to the students' change in test scores.

According to Fleming and Mills (1992) the "Kinesthetic Preference" modal involves learning through experience, examples, practice or simulation. Since our Case involved hands on experience in calculating and analyzing actual company information, it was expected that the students with the "Kinesthetic Preference" should improve their exam scores. "Read/Write Preference" students learn more efficiently when the information is displayed as words. The Case required the students to read the companies' annual reports and/or SEC 10-K reports to calculate the ratios and to answer the Case

questions. In addition, the students were required to write a team report and an individual report. As a result, the Case should be beneficial to the students with the “Read/Write Preference” learning style.

As previously mentioned the “Aural Preference” modal involves learning from lectures, tutorial and talking to other students. Since the Case was a team project, the students should have discussed their findings with each other before preparation of the written team report. Further, the students were required to orally present their report, which should permit some learning by the audience during the class presentations. Therefore, it was expected that the Case should be somewhat beneficial to students with the “Aural Preference” learning style. The “Visual Preference” modal involves depiction in the form of charts, graphs, flowcharts, symbolic arrows, circles, hierarchies, and other methods that can be used to represent what could be presented in words. The Case did not emphasize examination of a company’s annual report for charts, graphs, etc. Therefore, it was expected that this Case may not result in much improvement by the students who have the “Visual Preference” learning style. However, keep in mind that the students can have more than one learning preference.

RESULTS

The majority of the students’ exam scores in each of the four semesters, which were related to the financial statement analysis topics, increased or stayed the same after the Case was completed. The median score increased from 50% on Exam II (EII) to 87.5% on the Final Exam (FE) during Spring 2009; 33% on EII to 70% on FE during Spring 2010; 16.7% on EII to 70% on FE during Fall 2010; and 16.7% on EII to 66.7% on FE during Spring 2011. Also, the mean score increased from 35.53% on EII to 76.32% on FE during Spring 2009; 32.05% on EII to 74.62% on FE during Spring 2010; 26.96% on EII to 67.35% on FE during Fall 2010; and 18.52% on EII to 63.89% on FE during Spring 2011. The students’ Exam II and Final Exam scores were matched by names. The Wilcoxon signed rank test was utilized to test H_1 ($EII \geq FE$). Since there was a significant difference (at $p = .01$) for each semester, H_1 was rejected. The students’ exam scores significantly increased as a result of this active-learning exercise. It appears that the Case preparation and presentation can be helpful in learning financial statement analysis topics.

The pre-test/post-test data were also used to evaluate whether the financial statement analysis case project (Case) was more beneficial or helpful for the students with different learning preferences. The students’ learning preferences using the VARK inventory instrument were compared to the students’ change in test scores between the pre-test and the post-test. A high percentage of the students with the “Kinesthetic Preference,” had test scores that improved or remained the same (92.86 % for Spring 2009; 83.33% for Spring 2010; 96.55% for Fall 2010; and 91.67% for Spring 2011). This result was as expected because the Financial Statement Analysis Case involved hands on experience in calculating and analyzing actual company information, which reflected the learning style (Kinesthetic) of these students. The percentages of students whose exam scores improved or remained the same were similar over each of the four semesters. Therefore, the Case preparation and presentation seems to be a good teaching technique for students with the Kinesthetic Preference.

All of the “Read/Write Preference” students’ [except for Fall 2010 (95.24%)] test scores improved or remained the same. Again, the result was as expected because the Case requirements reinforced both reading and writing. In order to answer the questions incorporated in the Case, the students needed to read parts of the company’s annual report and/or SEC Form 10-K. Also, the Case required the students to write a team report and an individual report. Once more, the percentages of the students whose exam

scores improved or remained the same were almost identical over each of the four semesters. As a result, it looks as if the Case is a satisfactory teaching method for students with the Read/Write Preference.

A high percentage of the “Aural Preference” students’ test scores improved or remained the same (88.89% for Spring 2009, 88.89% for Spring 2010, 95.45% for Fall 2010, and 83.33% for Spring 2011), which was as expected. Students with the aural learning preference should have benefited from discussing their findings with each other before preparation of the written team report. Also, the student oral presentations should have permitted some learning by the aural preference audience during the class presentations. Again, the percentages of student exam scores that increased or remained the same were basically the same over each of the four semesters. Thus, the Case preparation and presentation appears to be a good teaching method for students with the Aural Preference.

But, the “Visual Preference” student results were opposite of what was expected, which was little or no improvement. A high percentage of the visual preference students’ test scores improved or remained the same [100% for Spring 2009, 83.33% for Spring 2010, 93.33% for Fall 2010, and 100% for Spring 2011]. However, the visual preference students were relatively few in number; only 26.32% for Spring 2009; 46.15% for Spring 2010; 46.88% for Fall 2010; and 27.78% for Spring 2011 of the students as compared to students with the Kinesthetic Preference, 73.68% for Spring 2009; 92.31% for Spring 2010; 90.63% for Fall 2010; and 66.67% for Spring 2011.

In addition, as stated earlier, students can have more than one learning preference. In fact, all of the visual students were multi-modal. Further, the number of students with the visual preference were higher in the semesters in which a relatively high number of the students were classified as VARK [i.e., the students had all four learning preferences]. Since all of the visual preference students were multi-modal, this fact could explain why the test scores were much better than expected for these students. It could be that the other learning preferences of these multi-modal students had a more important influence in the test scores than the Visual Preference modal.

About 25% of the students in the four semesters of Intermediate Accounting I were one-modal. As a result, it was important to incorporate teaching techniques in the classroom that would allow these one-modal students to benefit from an assignment or teaching technique. It appears that the Case did allow the students with one-modal preferences to experience a learning technique that should help them in studying the financial statement analysis topics. Also, the Case, which involved hands on experience in calculating and analyzing actual company information, should be beneficial to the majority of the one-modal students (i.e., Kinesthetic Preference).

Further, the Case gave the students an opportunity to improve their interpersonal and communication skills as recommended by the Pathways Commission (2012), the International Federation of Accountants in IES3 (2008), and PricewaterhouseCoopers in Educating for the Public Trust (2003).

REFERENCES

References are available upon request from: Judith A. Sage, A. R. Sanchez, Jr. School of Business, Texas A & M International University, 5201 University Blvd., Laredo, TX 78041, 956-727-1999, lloydsage@aol.com